

Audit



Report

CONTRACT AWARD FOR THE  
FLUID FLOW RESTRICTOR SPARE PART

Report No. D-2001-001

October 3, 2000

Office of the Inspector General  
Department of Defense

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### **Acronyms**

AMS	Aerospace Material Specification
DLA	Defense Logistics Agency
DSCC	Defense Supply Center, Columbus
GE	General Electric



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
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October 3, 2000

MEMORANDUM FOR ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)  
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Audit Report on Contract Award for the Fluid Flow Restrictor Spare Part  
(Report No. D-2001-001)

We are providing this report for your information and use. The audit was performed in response to a congressional request from Senator Joseph I. Lieberman.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Terry L. McKinney at (703) 604-9288 (DSN 664-9288) or Mr. Henry F. Kleinknecht at (703) 604-9324 (DSN 664-9324). See Appendix B for the report distribution. The audit team members are listed inside the back cover.

A handwritten signature in black ink, reading "Robert J. Lieberman", is positioned above the typed name.

Robert J. Lieberman  
Assistant Inspector General  
for Auditing

## Office of the Inspector General, DoD

**Report No. D-2001-001**  
(Project No. D2000CF-0155)

**October 3, 2000**

### **Contract Award for the Fluid Flow Restrictor Spare Part**

#### **Executive Summary**

**Introduction.** This audit was performed in response to a request from Senator Joseph I. Lieberman, on behalf of Birken Manufacturing Company (Birken). Birken alleged that the Defense Supply Center, Columbus, improperly awarded a contract for fluid flow restrictors to General Electric at a price significantly higher than the one proposed by Birken. The contract for 48 fluid flow restrictors was awarded at a unit price of \$984.04 compared to Birken's quote of \$221.40. Birken alleged its quote was improperly rejected because it included use of a substitute material. The drawing for the fluid flow restrictor specifies that Inconel or AMS 5524 be used to manufacture the part. Birken claimed that use of the substitute material was accepted on previous contracts and that there had never been a problem with the material.

The fluid flow restrictor is a flight-critical, consumable item used on the fuel system of the J85 engine for the Air Force T-38 aircraft. General Electric is the original equipment manufacturer for the engine. The fluid flow restrictor is managed by the Defense Supply Center, Columbus, a component of the Defense Logistics Agency.

**Audit Objective.** The audit objective was to determine whether the Defense Logistics Agency properly awarded the contract for the fluid flow restrictors in accordance with the terms of the solicitation.

**Audit Results.** The Defense Supply Center, Columbus (DSCC) properly awarded the contract for fluid flow restrictors to General Electric because the proposal from Birken Manufacturing Company (Birken), the low bidder, specified use of a substitute material that was not approved by the engineering support activity. DSCC granted Birken material substitutions on prior procurements; however, DSCC notified Birken that the material substitution was not a permanent acceptable material for future contracts. Future proposals for the fluid flow restrictors from Birken specifying use of the approved material should be acceptable and DSCC should be able to obtain the spare parts at the lower unit price of \$221.40 versus \$984.04—a savings of 77.5 percent. We calculate that, based on an annual demand of from 44 to 176 fluid flow restrictors, DSCC can save between \$201 and \$805 thousand over a 6 year period using competitive procedures and procuring the parts from the low bidder.

**Management Comments.** We provided a draft of this report on August 18, 2000. No written response was required, and none was received. Therefore, we are publishing the report in final form.

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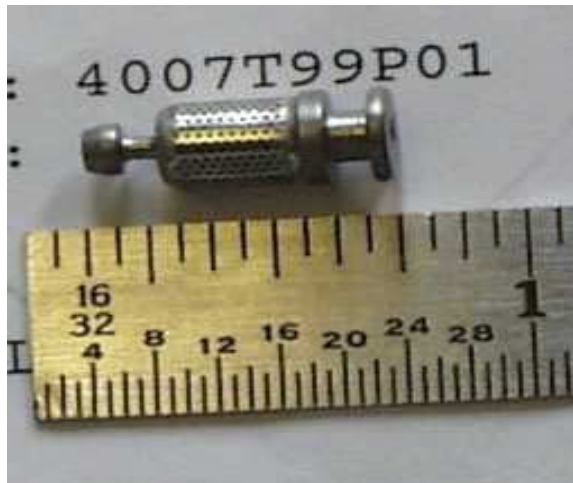
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## Background

**Congressional Request.** This audit was requested by Senator Joseph I. Lieberman on behalf of a constituent, Birken Manufacturing Company, who alleged that the Defense Supply Center, Columbus (DSCC) improperly awarded contract number SP074000MNB11 for 48 fluid flow restrictors at a price significantly higher than the one offered by Birken. Specifically, the allegations stated that DSCC improperly rejected Birken's offer to manufacture the fluid flow restrictor using a substitute material, even though Birken had been authorized to use the material on two previous DSCC contracts.

**Fluid Flow Restrictor.** The fluid flow restrictor, National Stock Number 4730-00-942-9149, is a flight-critical, consumable item used on the fuel system of the J85 engine for the Air Force T-38 aircraft. There are 562 T-38 aircraft currently in service, each containing two General Electric (GE) J85 engines. The fluid flow restrictor, GE part number 4007T99P01, is shown in the figure. The one-quarter-inch, perforated cylinder on the part is referred to as the "screen." This is the part requiring specific material, as discussed in this report.



**Fluid Flow Restrictor**

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**Procurement History.** Historically, the fluid flow restrictor has been supplied by either Birken or GE, the original equipment manufacturer. The table below shows the procurement history of the item from October 1997 through July 2000. The average annual demand for the part, based on the quantity requisitioned from 1997 through 1999, was 44. However, DSCC recently solicited bids to manufacture 279 fluid flow restrictors. Contract award is pending.

<b>Procurement History for Fluid Flow Restrictor</b>					
<u>Contract No.</u>	<u>Date</u>	<u>Contractor</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Total Price</u>
SP074097M8385	7/02/97	Birken	\$ 187.50	40	\$ 7,500
SP074099MLX49	3/05/99	Birken	\$ 193.50	54	\$10,449
F3460197G0002UBTD	5/11/99	G.E.	\$1,325.31	20	\$26,506
SP074000MNB11	2/11/00	G.E.	\$ 984.04	48	\$47,234

## Objective

The audit objective was to determine whether the Defense Logistics Agency properly awarded the contract for the fluid flow restrictors in accordance with the terms of the solicitation.



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## Contract for Fluid Flow Restrictor

DSCC properly awarded the contract for fluid flow restrictors to General Electric because the proposal from Birken Manufacturing, the low bidder, specified use of a substitute material that was not approved by the engineering support activity. However, after discussions with representatives from Birken and the manufacturer of the approved material (Inconel), it was determined that Birken could obtain the approved material at about the same price as the substitute material. As a result, future proposals for the fluid flow restrictors from Birken using the approved material should be acceptable and DSCC should be able to obtain the spare parts at the lower unit price. In this case, the Government's unit price would have been \$221.40 versus \$984.04—a savings of 77.5 percent. We calculate that, based on an annual demand of from 44 to 176 fluid flow restrictors, DSCC can save between \$201 and \$805 thousand over a 6 year period using competitive procedures and procuring the parts from the low bidder.

### Request for Quotes

On October 5, 1999, DSCC requested quotes for manufacture of 48 fluid flow restrictors made in accordance with applicable drawings and specifications. As a result, DSCC received quotes from four contractors. Birken submitted the lowest priced quote of \$221.40. However, the bid specified use of a substitute material to manufacture the fluid flow restrictors. The quote stated that Aerospace Material Specification 5540 (hereafter referred to as Inconel), the required material, was not available and that the substitute material specified in its bid had been accepted for use on a prior contract. Two other contractors submitted quotes of \$225 and \$241.95 to provide surplus parts previously manufactured by Birken. GE submitted a quote of \$984.04 without exception to the specifications, indicating GE planned to use the required material.

### Basis for Contract Award

The DSCC decision to award the contract to GE was appropriate under the circumstances. On February 11, 2000, DSCC awarded the contract to GE at a total contract cost of \$47,234 citing the GE quote as the only acceptable bid. Birken's quote proposed using a substitute material that the solicitation clearly stated was unacceptable. Birken had received approval to use the same substitute material on two previous fluid flow restrictor contracts, however, the basis for the approval was unique to each contract and did not apply to subsequent solicitations.

**Material Requirement for Fluid Flow Restrictor.** Birken's plan to use a substitute material did not meet solicitation requirements. The solicitation cited the drawing for GE part number 4007T99P01. The drawing, which was dated June 27, 1975, specified that the screen for the fluid flow restrictor be made from one of two acceptable materials, Inconel, or Aerospace Material Specification

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(AMS) 5524. The solicitation reiterated the material requirement, stating that use of material other than Inconel or AMS 5524 was unacceptable. Inconel is the preferred material, AMS 5524, a class 316 stainless steel, is the alternate material. Both materials are known for their high resistance to heat and corrosion.

**Substitute Material Used by Birken.** Birken requested and was granted a deviation from using the required material on two previous fluid flow restrictor contracts, stating that Inconel was not available at the time of material purchase. Birken received approval to use a substitute material referred to as QQ-S-766D, a class 304L stainless steel. However, the approval granted was unique to the circumstances for each contract and did not extend to future contracts. Because the fluid flow restrictor is a flight critical item, all waivers or deviations to required drawings and specifications must be approved by the Air Force engineering support activity, San Antonio, Texas.

**First Request for Material Deviation.** On January 13, 1998, Birken submitted a request for a material deviation to use a substitute material in lieu of required material for the restrictor screen on contract SPO74097M8385. Birken claimed that Inconel was not available and that the material substitution had no effect on the cost or price of the part and did not affect its form or function. Birken obtained an independent analysis of the substitute material in comparison to the required materials by contracting with a metallurgist from Henry Souther Laboratories. In a February 6, 1998, memorandum to Birken the independent metallurgist concluded that the substitute material, QQ-S-766D had "similar alloy elements" to AMS 5524. However, the analysis was inadequate in that it did not reference a comparison of the substitute material to Inconel or provide detailed results of the type of analysis performed. The drawing specifies additional requirements when AMS 5524 is used. On February 10, 1998, without contacting the engineer support activity or conducting any extensive engineering tests to show that the substitute material was an acceptable alternate, the Defense Contract Management Command, Hartford (the office responsible for administering the contract) approved Birken's request.

**Second Request for Material Deviation.** On April 7, 1999, Birken submitted a request for material deviation on another fluid flow restrictor contract, SPO74099MLX49, that was awarded March 5, 1999. The second request cited the same reason as the first for deviation, and included a comment that the substitute material had been approved for use on a previous contract, SP074097M8385. In later correspondence with DSCC, Birken stated that AMS 5524 also was unavailable. Based on input from the engineering support activity, DSCC approved the deviation on November 16, 1999 (after Birken had responded to the October 5, 1999 solicitation). The engineering support activity approved the one time deviation due to the urgent need for the parts and the small quantity involved.

**Material Substitution on Future Contracts.** In a letter to Birken dated December 10, 1999, DSCC clarified the position of the engineering support activity on material substitutions related to the restrictor screen for future contracts. Specifically, the letter stated that material substitutions had been approved on prior contracts to keep production lines open; however, use of the

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substitute material was not a permanent solution and would not be acceptable on future contracts. The letter also stated that DSCC believed the required materials were available. Based on the decision from the engineering support activity and prior to awarding the latest contract, SP074000MNB11, DSCC requested Birken to respond on whether it would comply with the material requirements. Birken continued to maintain that the required material was unavailable, and on April 18, 2000, requested a permanent material substitution for all future contracts for the fluid flow restrictor.

## **Availability of Required Material**

**Source of Required Material.** Special Metals, Huntington, West Virginia, is the sole manufacturer of Inconel. Meanwhile, AMS 5524 is available industry-wide from multiple suppliers. We contacted Special Metals and found that it manufactures Inconel in bulk, that the product is available, and that other manufacturers make the product into screens. We passed the information on to Birken and suggested that the company follow up on it for use on future contracts.

**Availability of Inconel.** In response, Birken contacted Special Metals and, in a June 27, 2000, letter to the Office of the Inspector General, DoD, stated that Birken had obtained a quote for a minimum purchase of Inconel. The price quoted for the required material was the same price Birken paid for a similar amount of the substitute material, QQ-S-766D. As a result, Birken stated that depending on the size of the next DSCC order, Birken's price on fluid flow restrictors should not significantly increase from the price quoted for the latest solicitation (contract SP074000MNB11).

## **Ongoing Procurement**

**Increased Demand.** On May 17, 2000, DSCC solicited bids for 279 fluid flow restrictors, a significant increase compared to quantities purchased since October 1997. (See table on page 2.) DSCC's latest annual demand forecast of 176 items is four times greater than the average number of items requisitioned annually by customers since FY 1997. The demand increased because flight hours on the T-38 aircraft, the primary trainer for the Air Force, doubled in the past 2 years due to the large number of pilots leaving the military and the resulting need to train new pilots. The T-38 will continue to experience high usage because the acquisition for a new trainer, which was to be phased in to replace the T-38 aircraft, was canceled.

**Response to Solicitation.** Of 20 small business manufacturers solicited for 279 fluid flow restrictors, DSCC received 4 acceptable offers. The bids ranged from \$115 to \$1,251.51 and all four proposed using the required material. Birken responded to the solicitation, however, its offer was not received in a timely manner. To prevent material requirement problems on the fluid flow restrictor screen similar to those experienced in the past, DSCC is currently evaluating alternative actions. For example, they may cancel the current solicitation in order to add additional requirements to the existing acquisition item description. The

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acquisition item description for future solicitations would require the awardee to provide a full material certification. The certification, which would be obtained from the supplier of the required material, would state the material's specifications. DSCC is also considering the inclusion of a requirement for first article testing.

## **Summary**

DSCC is actively pursuing alternatives to increase competition while obtaining fluid flow restrictors that are manufactured in accordance with required drawings and specifications. Birken's future proposals for fluid flow restrictors using the approved material should be acceptable. As a result, DSCC should be able to obtain the spare parts at the lower unit price of \$221.40 versus \$984.04—a savings of 77.5 percent. Over a 6 year period, we calculate that, based on an annual demand of from 44 to 176 fluid flow restrictors, DSCC can save between \$201 and \$805 thousand using competitive procedures and procuring the parts from the low bidder. DSCC's efforts to obtain additional qualified sources for the item, if successful, could result in additional savings to DoD.

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## Appendix A. Audit Process

### Scope and Methodology

**Work Performed.** We limited our review to acquisition of the fluid flow restrictor, National Stock Number 4730-00-942-9149, part number 4007T99P01. To determine if DLA had improperly awarded the contract, we reviewed the quotes submitted for the fluid flow restrictor and compared the unit prices and quantities proposed by each contractor. We also reviewed each quote to determine whether it was offered without or with exception, indicating the intent by each contractor to use the required material or a substitute, respectively. We obtained information for four different contracts for the fluid flow restrictors awarded by DSCC. We reviewed two requests for material deviation and the circumstances under which the deviations were approved. We also reviewed the different types of materials used to manufacture the fluid flow restrictor and how its chemical composition affects the performance of the part.

**DoD-Wide Corporate Level Government Performance and Results Act (GPRA).** In response to the GPRA, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following goal, subordinate performance goal, and performance measure:

**FY 2000 DoD Corporate Level Goal 2:** Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs, and reengineer the Department to achieve a 21st century infrastructure. **(00-DoD-2)**  
**FY 2000 Subordinate Performance Goal 2.3:** Streamline the DoD infrastructure by redesigning the Department's support structure and pursuing business practice reforms. **(00-DoD-2.3)** **FY 2000 Performance Measure 2.3.1:** Logistics Response Time. **(00-DoD-2.3.4)**

**DoD Functional Area Reform Goals.** Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objective and goal.

**Logistics Functional Area. Objective:** Streamline logistics infrastructure. **Goal:** Reduce weapon system cost of ownership. **(LOG-3.3)**

**Use of Computer-Processed Data.** To achieve the audit we relied on computer-processed data from the Defense Logistics Agency. Specifically, we queried the Standard Automated Material Management System to determine the customers and average annual demand for fluid flow restrictors requisitioned from 1997 through 1999. The computer-processed data were determined reliable based on results of recent spare parts audits at Defense Logistics Agency. Nothing came to

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our attention as a result of specified procedures that caused us to doubt the reliability of the computer-processed data.

**Audit Type, Dates, and Standards.** We performed this program audit from May 2000 through July 2000 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not review the management control program because it had no bearing on the allegation.

**Contacts During the Audit.** We visited or contacted individuals within the DoD. Further details are available on request.

## **Prior Coverage**

No prior coverage has been conducted on the subject during the past 5 years.

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## **Appendix B. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense for Acquisition, Technology, and Logistics  
Deputy Under Secretary of Defense (Acquisition Reform)  
Deputy Under Secretary of Defense (Logistics)  
Director, Defense Logistics Studies Information Exchange  
Director, Defense Procurement  
Under Secretary of Defense (Comptroller/Chief Financial Officer)  
Deputy Chief Financial Officer  
Deputy Comptroller (Program/Budget)

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Assistant Secretary of the Air Force (Financial Management and Comptroller)  
Auditor General, Department of the Air Force

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Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Reform  
House Subcommittee on Government Management, Information, and Technology,  
Committee on Government Reform  
House Subcommittee on National Security, Veterans Affairs, and International  
Relations, Committee on Government Reform



## **Audit Team Members**

The Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector, DoD, who contributed to the report are listed below.

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